

CLAIMS

The embodiments in which an exclusive property or privilege is claimed are defined as follows:

1. A method for automatically starting an internal combustion engine installed in a vehicle having an electronic engine control system in communication with a starter motor and a plurality of fuel injectors, the method comprising:

determining that one of three conditions exist, a voltage of a battery is below a predetermined limit, a temperature of the engine is below a predetermined limit, or a temperature of a cab of the vehicle is outside of a predetermined temperature range;

confirming that a hood is closed, that a transmission is in neutral, and that a park brake is set;

confirming that a fuel level is above a predetermined level; and starting the engine.

2. The method of automatically starting the combustion engine set forth in Claim 1 further comprising warning an operator of a pending engine start before the step of starting the engine.

3. The method of automatically starting the combustion engine set forth in Claim 1 further comprising:

confirming that an ignition switch is in an on position and the engine is idling; and

automatically shutting down the engine immediately before the step of determining whether three conditions exist.

4. The method of automatically starting the combustion engine set forth in Claim 3 further comprising:

enabling an idle shutdown timer;
initiating a pre-programmed countdown of the shutdown timer to automatic engine shutdown; and

confirming that an active switch has been placed in an on position prior to expiration of the countdown after the step of confirming that an ignition switch is in an on position and the engine is idling and before the step of automatically shutting down the engine.

5. The method of automatically starting the combustion engine set forth in Claim 4 further comprising confirming that the hood is closed, that the transmission is in neutral, and that the park brake is set prior to the step of enabling the idle shutdown timer and after the step of confirming that the ignition switch is in the on position and the engine is idling.

6. The method of automatically starting the combustion engine set forth in Claim 5 further comprising warning an operator of a pending engine start immediately before the step of start engine.

7. The method of automatically starting the combustion engine set forth in Claim 6 further comprising:

confirming the engine did not start after the step of start engine;
initiating a pre-programmed time delay;
attempting a second engine start;
confirming the engine did not start; and
deactivating the engine control system.

8. An engine control system for automatically starting and stopping a vehicle combustion engine at idle via a series of fuel injectors and a starter motor, the engine control system comprising:

a battery having a positive lead;
an engine control module;
a first enabler circuit providing a digital input to the engine control module, the first enabler circuit having a park brake switch, a hood switch, and a neutral gear switch, wherein the park brake switch, the hood switch and the neutral gear switch are wired in series and grounded; and
a fuel level switch engaged electrically to the engine control module for indicating a low fuel level condition below a predetermined amount which overrides automatic starting of the engine by the engine control system.

9. The engine control system set forth in Claim 8 comprising a second enabler circuit extending electrically between the positive lead and the engine control module, the second enabler circuit having an ignition switch having an on position for enabling the engine control system.

10. The engine control system set forth in Claim 8 comprising a second enabler circuit extending electrically from a fuel level signal device and directly to the engine control module.

11. The engine control system set forth in Claim 10 wherein the signal device is an analog voltage sensor.

12. The engine control system set forth in Claim 10 wherein the signal device is a switch which triggers at a pre-determined low fuel level for sending a digital low fuel signal to the engine control module.

13. The engine control system set forth in Claim 9 wherein the second enabler circuit has the fuel level switch which is wired in series between the ignition switch and the ECM.

14. The engine control system set forth in Claim 8 wherein the first enabler circuit has the fuel level switch which is wired in series with the park brake switch, the hood switch and the neutral gear switch.

15. The engine control system set forth in Claim 14 comprising a low voltage input to the engine control module for initiating an automatic engine start on low battery voltage.

16. The engine control system set forth in Claim 14 comprising an engine temperature input for initiating an automatic engine start on low engine temperature.

17. The engine control system set forth in Claim 14 comprising:

- a thermostat controller;
- a thermostat input extended between the thermostat controller and the ECM; and
- a thermistor for measuring temperature within a cab of the vehicle and inputting the signal into the thermostat controller which outputs an initiating signal to the engine control module via the thermostat input.

18. An engine control system for automatically starting and stopping a vehicle combustion engine at idle; the system comprising:

- an engine control module for receiving inputs and providing an initiating output for starting and stopping the engine;

- an input for sending an initiating signal to the engine control module from a monitoring sensor to allow said engine control system to automatically start said engine; and

- a first safety enabler circuit monitoring a first set of parameters whereby each parameter is orientated with a respective grounded switch and opening

of any one switch will prevent the engine control module from starting said engine; and wherein one of the switches is orientated with a predetermined level of fuel in a fuel tank for said engine.

19. An engine control system for automatically starting and stopping a vehicle combustion engine at idle; the system comprising:

an engine control module for receiving inputs and providing an initiating output for starting and stopping the engine;

an input for sending an initiating signal to the engine control module from a monitoring sensor to allow said engine control system to automatically start said engine;

a first safety enabler circuit monitoring a first set of parameters such that when any one of said parameters is outside of a predetermined range, the safety enabler circuit will prevent the engine control module from starting said engine; and

one of the parameters in said first set of parameters being the level of fuel in a fuel tank for said engine and said predetermined range being above a predetermined level.